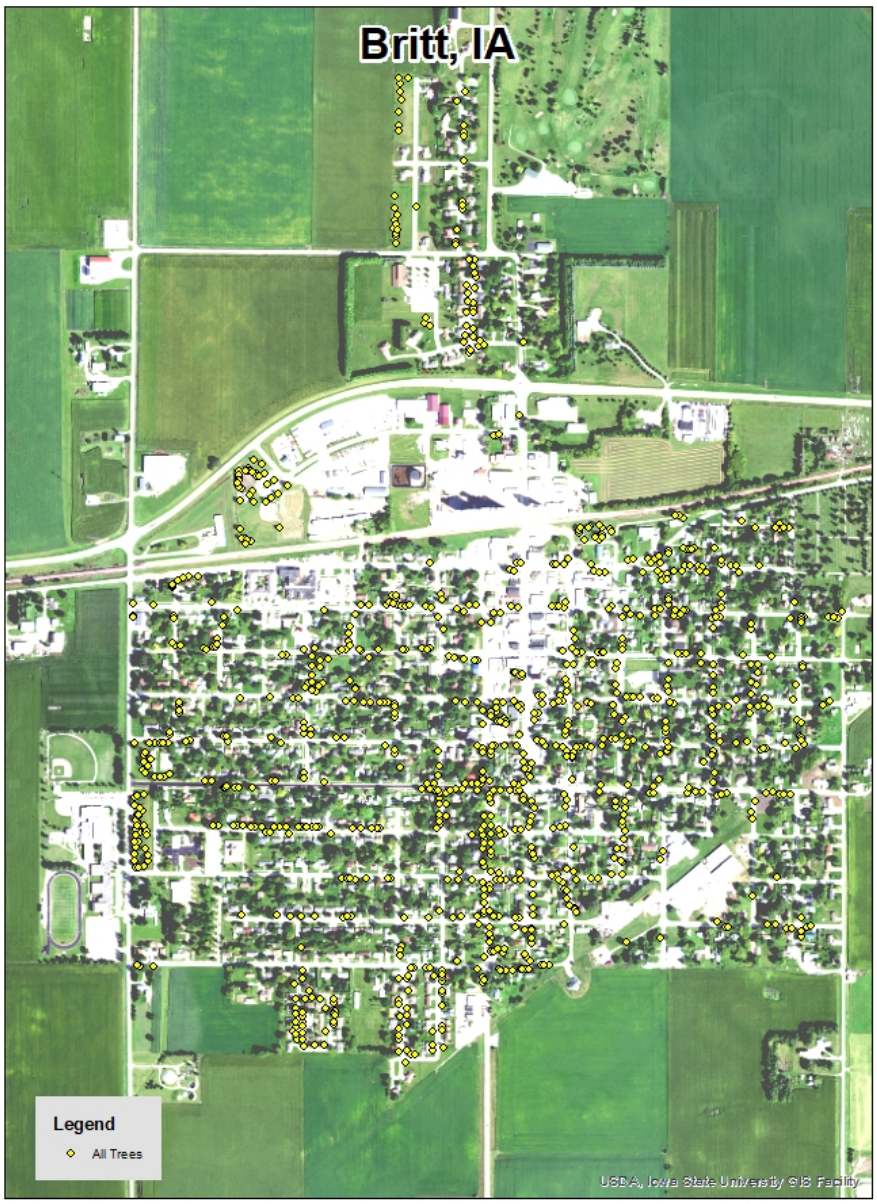
Britt, IA



2020 Urban Forest Management Plan
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Executive Summary

Overview

This plan was developed to assist the City of Britt with managing its urban forest, including budgeting and future planning. Trees can provide a multitude of benefits to the community, and sound management allows a community to best take advantage of these benefits. Management is especially important considering the serious threats posed by forest pests such as the emerald ash borer (EAB). EAB is an invasive insect imported from Eastern Asia on wood shipping crates that kills all species of ash trees (this does not include mountain ash). There is a strong possibility that 20% of Britt's city owned trees (ash) will die once EAB becomes established in the community, unless preventative treatment is used. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues.

Inventory and Results

In 2019, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees. Below are some key findings of the 950 trees inventoried.

- Britt's trees provide $206,287 of benefits annually, an average of $217 a tree
- There are over 46 species of trees
- The top three genera are: Maple 41%, Ash 20%, and Apple (crabapple) 12%
- 52% of trees are in need of some type of management
- 4 trees are recommended for removal

Recommendations

The core recommendations are detailed in the Recommendations Section. The Emerald Ash Borer Plan includes management recommendations as well. Below are some key recommendations.

- Britt has 5 critical concern trees that need immediate trimming and 4 trees marked for removal*City ownership of the trees recommended for removal should be verified prior to any removal*
- 29 of the 187 ash trees should be carefully examined, as they have one or more symptoms that could be related to an EAB infestation
- All trees should be pruned on a routine schedule- one third of the city every other year
- Plant a diverse mix of trees that do not include: ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut
- Check ash trees with a visual survey yearly
- With the current budget it could take 63 years to remove ash – Suggestion: request a budget increase to $10,000 annually and apply for grants to plant replacement trees

Introduction

This plan was developed to assist Britt with the management, budgeting and future planning of their urban forest. Across the state, forestry budgets continue to decrease with more and more of that money spent on tree removal. With the anticipated arrival of Emerald Ash Borer (EAB), an invasive pest that kills native ash trees, it is time to prepare for the increased costs of tree removal or treatment and replacement planting. With proper planning and management of the current canopy in Britt, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

Trees are an important component of Britt's infrastructure and one of the greatest assets to the community. The benefits of trees are immense. Trees provide the community with improved air quality, stormwater runoff interception, energy conservation, lower traffic speeds, increased property values, reduced crime, improved mental health and create a desirable place to live, to name just a few benefits. It is essential that these benefits be maintained for the people of Britt and future generations through good urban forestry management.

Good urban forestry management involves setting goals and developing management strategies to achieve these goals. An essential part of developing management strategies is a comprehensive public tree inventory. The inventory supplies information that will be used for maintenance, removal schedules, tree planting and budgeting. Basing actions on this information will help meet Britt's urban forestry goals.

Inventory

In 2019, a tree inventory was conducted that included 100% of the city owned trees on both streets and parks. The tree data was collected using a handheld Global Positioning System (GPS) receiver. The data collector gives Geographic Information Systems (GIS) coordinates with an accuracy of 3 meters, which can be used in Arc GIS as an active GIS data layer. Because the inventory is a digital document the data can be updated with new information and become a working document.

The programming used to collect tree information on the data collectors was written to be compatible with a state-of-the-art software suite called i-Tree. i-Tree was developed by the USDA Forest Service to quantify the structure of community trees and the environmental services that trees provide. The i-Tree suite is a public domain which can be accessed for free.

To quantify the urban forest structure and benefits, specific data is collected for each tree. This data includes: location, land use, species, diameter at 4.5 ft, recommended maintenance, priority of that maintenance, leaf health, and wood condition. Additionally, signs and symptoms associated with EAB were noted for all ash trees. The signs and symptoms noted were canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Inventory Results

The data collected for the 950 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management as part of the i-Tree suite. The following are results from the i-Tree STREETS analysis.

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Britt's trees reduce energy related costs by approximately $51,640 annually (Appendix A, Table 1). These savings are both in Electricity (246.2 MWh) and in Natural Gas (18,683 Therms).

Annual Stormwater Benefits

Britt's trees intercept about 2,988,172 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $80,979 of benefits to the city.

Annual Air Quality Benefits

Air quality is a persistent public health issue in Iowa. The urban forest improves air quality by removing pollutants, lowering air temperature, and reducing energy consumption, which in turn reduces emissions from power plants, and emitting volatile organic matter (ozone). In Britt, it is estimated that trees remove 3,259.6 lbs of air pollution (ozone (O_3), particulate matter less than 10 microns (PM10), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2)) per year with a net value of $9,210 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Britt, trees sequester about 655,101 lbs of carbon a year with an associated value of $4,913 (Appendix A, Table 5). In addition, the trees store 12,170,950 lbs of carbon, with a yearly benefit of $91,282 (Appendix A, Table 4).

Annual Aesthetics Benefits

Social benefits of trees are hard to capture. The analysis does have a calculation for this area that includes: aesthetic value, property values, lowered rates of mental illness and crime, city livability and much more. Britt receives $56,908 in annual social benefits from trees (Appendix A, Table 6).

Financial Summary of all Benefits

According to the USDA Forest Service i-Tree STREETS analysis, Britt's trees provide $206,287 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 950 trees in Britt provide approximately $217 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Britt has over 46 different tree species along city streets and parks (Appendix A, Figure 1).
The distribution of trees by genera is as follows:

Maple	385	41%
Ash	187	20%

Apple (crabapple)	115	12%
Linden	83	9%
Spruce	64	7%
lilac	16	2%
Honey Locust	15	2%
Walnut	15	2%
White Cedar	10	1%
Birch	9	1%
Hackberry	9	1%
Oak	9	1%
Pine	7	1%
Other	6	1%
Dogwood	3	<1%
Mulberry	3	<1%
Mountain Ash	3	<1%
Elm	3	<1%
Plum/Cherry	2	<1%
Pear	2	<1%
Red Bud	1	<1%
Ginkgo	1	<1%
Magnolia	1	<1%
Aspen	1	<1%

Age Class

Most of Britt's trees (33%) are between 18 and 30 inches in diameter at 4.5 ft (Appendix A, Figure 2). For age, it is preferred that the highest amounts of trees are in the size category (a downward slope) to prepare for natural mortality and to maintain canopy cover. Britt's size curve peeks in the medium size category, indicating a slowdown in planting in recent years.

Condition: Wood and Foliage

Both wood condition and leaf condition are good indicators of the overall health of the urban forest. The foliage condition results for Britt indicate that 89% of the trees are in good health, with only 2% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Additionally, 15% of Britt's trees are in good health for wood condition (appendix A, Figure 4 & Appendix B, Figure 3). Wood condition that is in poor health, dead or dying is about 11% of the population. This 11% is an estimate of trees that need management follow up.

Management Needs

The following outlines the specific management needs of the street and park trees by number of trees and percent of canopy (Appendix B, Figure 3).

Crown Cleaning	335	35%
Crown Raising	73	8%

Crown Reduction	72	8%
Tree Staking	13	1%
Tree Removal	4	<1%

Canopy Cover

The total canopy with both private and public trees is 15%, 120 acres. The canopy cover included in the Britt inventory includes approximately 29 acres (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 3%, in 30 years. To achieve this goal it is estimated that 59 trees need to be planted annually on public and private lands.

Land Use and Location

The majority of Britt's city and park trees are in planting strips in single family residential neighborhoods (Appendix A, Figure 6 & Appendix A, Figure7). The following describes the land use and locations for the street and park trees.

Land Use	
Single family residential	62%
Park/vacant/other	33%
Multifamily residential	2%
Industrial/Large commercial	1%
Small commercial	<1%

Location	
Front yard	54%
Planting strip	44%
Cutout (surrounded by pavement)	8%

Recommendations

Risk Management

Hazardous trees can be a significant threat to both people and property. Trees that are dead or dying, or that have large issues such as trunk cracks longer than 18 inches should be removed. Broken branches and branches that interfere with motorist's vision of pedestrians, vehicles, traffic signs and signals, etc should be removed.

Tree Risk

Britt has 5 critical concern trees that need immediate trimming. These trees can be seen on the Location of Trees with Recommended Maintenance map (Appendix B, Figure 4). It is recommended to start with the large diameter critical concern trees first. There are 22 of the 26 trees over 24 inches in diameter at 4.5 ft that should be addressed immediately. Please refer to the six year maintenance plan at the end of this section. After all of the critical concern trees are addressed, there should be follow up on the trees marked as needing maintenance. There are a total of 607 trees with these needs.

Poor tree species

After the removal of the critical concern trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 4 removals, none are ash trees. There are a total of 187 ash trees, and 29 of those have signs and symptoms that have been associated with EAB. In addition, there are 6 trees that are in poor health. *City ownership of the trees recommended for removal should be verified prior to any removal*

Pruning Cycle

Proper pruning can extend the life and good health of trees, as well as reduce public safety issues. In the Management Needs section of the Findings there are four main maintenance issues to be addressed: routine pruning, crown cleaning, crown raising, and crown reduction. Crown cleaning removes dead, diseased, and damaged limbs. Crown raising is the removal of lower branches that are 2 inches in diameter or larger in the case of providing clearance for pedestrians or vehicles. Crown reduction is removing individual limbs from structures or utility wires. It is recommended that all trees be pruned on a routine schedule every five to seven years. Please refer to the six year maintenance plan for further information.

Planting

Most of the planting over the next 5 years will replace the trees that are removed. It is recommended to plant 1.2 trees for every tree removed, since survival rates will not be 100%. Please refer to the six year maintenance plan at the end of this section. It is not essential that the new trees be planted in the same location of the trees being removed. However, maintaining the same number of trees helps ensure continuation of the benefits of the existing forest in Britt.

It is important to plant a diverse mix of species in the urban forest to maintain canopy health, since most insects and diseases target a genus (ash) or species (green ash) of trees. Current diversity recommendations advise that a genus (i.e. maple, oak) not make up more than 20% of the urban forest and a single species (i.e. silver maple, sugar maple, white oak, bur oak) not make up more than 10% of the total urban forest. Presently, the forest is heavily planted with maple (41%) (Appendix A, Figure 1). Maples should not be planted until this percentage can be lowered. Also, ash trees have not been recommended since 2002, due to the threat of EAB. Other species to avoid because they are public nuisances include: any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, box elder, Chinese elm, or evergreens. Section 6-8-3 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance 6-8-3 (Appendix C).

Continual Monitoring

Due to the threat of EAB, it is important to continuously check the health of ash trees. It is recommended that ash trees be checked with a visual survey every year for tree decline and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Six Year Maintenance Plan with <u>No Additional Funding</u>

Year 1

Removal: 2 trees

*Or saving for ash tree treatment and/or future ash removal

Planting and Replacement: 3 trees in open locations from year one removals

Young Tree Pruning & Maintenance:
Routine trimming: Trim city trees
Visual Survey for signs and symptoms of EAB

Year 2

Removal: 4 trees – 2 trees and removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 5 trees to be planted in open locations and locations from previous removals
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 3

Removal: 2 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 3 trees in open locations from year one removals
Young Tree Pruning & Maintenance:
Routine trimming: Trim city trees
Visual Survey for signs and symptoms of EAB

Year 4

Removal: 4 trees – 2 trees and removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 5 trees to be planted in open locations and locations from previous removals
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 5

Removal: 6 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 3 trees in open locations from year one removals
Young Tree Pruning & Maintenance:
Routine trimming: Trim city trees
Visual Survey for signs and symptoms of EAB

Year 6

Removal: 4 trees – 2 trees and removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 5 trees to be planted in open locations and locations from previous removals
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

*Reduction of ash over 6 years: approximately 14 ash trees removed (approximately 7% of ash). **It will take approximately 63 years to remove all ash with the current budget.**

**To remove all ash trees within 6 years, the budget would need to be increased to $31,800 a year. If the budget were increased to $10,000 a year all ash could be removed in 19 years.

Emerald Ash Borer Plan

Ash Tree Removal

Tree removal will be prioritized with dead, dying, hazardous trees to be removed first (Appendix B, Figure 4). Next will be all ash in poor condition and displaying signs and symptoms of EAB (Appendix B, Figure 2 & Appendix B, Figure 3). *City ownership of the tree recommended for removal should be verified prior to any removal*

Treatment of Ash Trees

Chemical treatment can be effective tool for communities to spread removal costs out over several years while allowing trees to continue to provide benefits. However, treatment is not recommended if EAB is more than 15 miles away from the community. For more information on the cost of treatment strategies visit http://extension.entm.purdue.edu/treecomputer/

EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of millions of ash trees. Ash in both forested and urban settings constitute a significant portion of the canopy cover in the United States. Current tools to detect, control, suppress and eradicate this pest are not as robust as the USDA would desire. In order to stay ahead of this hard to detect beetle, the USDA is attempting to contain the beetle before it spreads beyond its known positions by regulating articles.

A regulated article under the USDA's quarantine includes any of the following items:

- emerald ash borer
- firewood of all hardwood species (for example ash, oak, maple and hickory)
- nursery stock and green lumber of ash
- any other ash material, whether living, dead, cut or fallen, including logs, stumps, roots, branches, as well as composted and not composted chips of the genus ash (Mountain ash is not included)

In addition, any other article, product or means of conveyance not listed above may be designated as a regulated article if a USDA inspector determines that it presents a risk of spreading EAB once a quarantine is in effect for your county.

Wood Disposal

A very important aspect of planning is determining how wood infested with EAB will be handled, keeping in mind that quarantines will restrict its movement. Consider who will cut and haul the dead and dying trees? Is there an accessible, secured site big enough to store and sort the hundreds of trees and the associated brush and chips? How will wood be disposed of or utilized? Do you have equipment capable of handling the amount and size of ash trees your tree inventory has identified? Once your county is under quarantine for EAB, contact USDA-APHIS-PPQ at 515-251-4083 or visit the website http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/regulatory.shtml. Wood waste can be disposed of as you normally would if your county is not part of a quarantine.

Canopy Replacement
As budget permits, all removed trees will be replaced. All trees will meet the restrictions in city ordinance 6-8-3 (Appendix C). The new plantings will be a diverse mix and will not any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, box elder, Chinese elm, or evergreens.

Postponed Work
While finances, staffing and equipment are focused on the management of ash, usual services may be delayed. Tree removal requests on genera other than ash will be prioritized by hazardous or emergency situations only.

Monitoring
It is recommended that ash trees be checked with a visual survey every year for tree death and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Private Ash Trees
It is strongly recommended that private property owners start removing ash trees on their property upon arrival of EAB if preventative treatments are not being used. City Code for private property should be followed.

Budget

Current Budget
Total $24,000 over 6 years ($4,000/year)

FY 2020 Budget
Removal: $1,600
*Or saving for ash tree treatment and/or future ash removal
Planting: $300
Routine trimming: $2,000
Watering & Maintenance: $100

FY 2021 Budget
Removal: $3,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $500
Watering & Maintenance: $300

FY 2022 Budget
Removal: $4,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $600
Routine trimming: $1,700

Watering & Maintenance: $500

FY 2023 Budget

Removal: $3,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $500
Watering & Maintenance: $300

FY 2024 Budget

Removal: $4,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $600
Routine trimming: $1,700
Watering & Maintenance: $500

FY 2025 Budget

Removal: $3,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $500
Watering & Maintenance: $300

*Reduction of ash over 6 years: approximately 14 ash trees removed (approximately 7% of ash). **It will take approximately 63 years to remove all ash with the current budget.**

Purposed Budget Increase

EAB could potentially kill all ash trees in Britt within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $31,800 a year. If the budget were increased to $10,000 a year all ash could be removed within 13 years. Additionally, it is recommended that Britt apply for grants to fund replacement trees. Utility Company grants are usually between $500 and $10,000 for community-based, tree-planting projects that include parks, gateways, cemeteries, nature trails, libraries, nursing homes, and schools.

Another option being considered by many communities is treating a number of selected trees, either to maintain those trees in the landscape or to delay their removal – to spread out the costs and number of trees needing removed all at once. Trunk injection is administered every two years for the life of the tree. If treatment is discontinued, the tree dies. For instance, in this treatment scenario, the average ash diameter is 20 inches and at $15 per inch, about 4 trees could be treated per year (every other year treatment). This would be 8 trees selected for treatment, and Britt would still need to find $8,000 for removal. Alternatively, if there are 15 treatable trees, it would cost approximately $2,250 a year for treatment and leave $1,800 for removal. These are alternatives to straight removal of ash trees. However, whether or not the treatment option is selected, there will be an increased cost of dealing with ash trees if EAB is found in Britt. It is suggested to consider increasing the budget to plan for this.

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Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Britt

Annual Energy Benefits of Public Trees

4/10/2020

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	78.9	5,988	10,757.2	10,542	16,530	(N/A)	26.0	32.0	64.32
Silver maple	63.9	4,852	8,431.7	8,263	13,116	(N/A)	17.7	25.4	74.95
Northern hackberry	21.0	1,591	2,986.2	2,926	4,517	(N/A)	8.5	8.7	53.77
Norway maple	20.0	1,516	2,843.0	2,786	4,302	(N/A)	8.2	8.3	53.11
Honeylocust	11.2	849	1,462.3	1,433	2,283	(N/A)	3.8	4.4	60.07
Apple	4.5	345	691.3	677	1,022	(N/A)	3.6	2.0	28.39
Sugar maple	3.4	260	462.6	453	713	(N/A)	3.4	1.4	20.97
Spruce	3.8	292	505.5	495	787	(N/A)	3.3	1.5	23.86
Northern red oak	2.1	163	300.3	294	457	(N/A)	3.2	0.9	14.29
Black walnut	6.4	486	893.1	875	1,361	(N/A)	2.0	2.6	68.07
Maple	2.2	168	310.8	305	472	(N/A)	2.0	0.9	23.61
Cottonwood	6.9	526	929.8	911	1,437	(N/A)	1.6	2.8	89.81
Northern catalpa	5.5	419	733.1	718	1,137	(N/A)	1.4	2.2	81.23
Littleleaf linden	2.3	174	324.1	318	492	(N/A)	1.4	1.0	35.11
Eastern red cedar	1.3	101	197.3	193	295	(N/A)	1.2	0.6	24.57
Kentucky coffeetree	0.1	6	12.0	12	18	(N/A)	1.2	0.0	1.52
Northern white cedar	0.9	69	124.0	122	191	(N/A)	0.8	0.4	23.86
Swamp white oak	0.1	5	11.7	11	17	(N/A)	0.8	0.0	2.09
Broadleaf Deciduous Small	0.5	37	74.8	73	110	(N/A)	0.7	0.2	15.78
River birch	0.8	57	109.7	108	164	(N/A)	0.6	0.3	27.42
American sycamore	1.3	99	180.6	177	276	(N/A)	0.6	0.5	46.04
Mulberry	0.9	72	152.2	149	221	(N/A)	0.6	0.4	36.82
American basswood	1.5	116	204.6	200	317	(N/A)	0.6	0.6	52.75
Willow	0.7	52	93.5	92	144	(N/A)	0.5	0.3	28.72
Amur maple	0.9	65	132.4	130	195	(N/A)	0.5	0.4	38.95
Ohio buckeye	0.3	22	46.9	46	68	(N/A)	0.5	0.1	13.60
Eastern redbud	0.1	7	15.3	15	22	(N/A)	0.5	0.0	4.33
Bur oak	0.3	21	40.0	39	60	(N/A)	0.5	0.1	11.99
Boxelder	1.0	75	138.5	136	211	(N/A)	0.4	0.4	52.66
Elm	0.5	34	64.3	63	97	(N/A)	0.3	0.2	32.46
American elm	0.1	6	12.0	12	18	(N/A)	0.3	0.0	6.04
Black maple	0.6	47	76.6	75	122	(N/A)	0.3	0.2	40.82
Pear	0.2	17	38.5	38	55	(N/A)	0.3	0.1	18.19
Conifer Evergreen Large	0.1	6	13.5	13	19	(N/A)	0.2	0.0	9.59
Lilac	0.2	15	32.2	32	47	(N/A)	0.2	0.1	23.50
Cherry plum	0.0	1	1.2	1	2	(N/A)	0.2	0.0	0.87
Oak	0.0	2	4.2	4	6	(N/A)	0.2	0.0	3.24
White ash	0.5	39	67.8	66	105	(N/A)	0.2	0.2	52.69
Blue spruce	0.2	17	33.5	33	50	(N/A)	0.2	0.1	25.13
Eastern white pine	0.1	10	14.6	14	24	(N/A)	0.1	0.0	24.14
Birch	0.0	3	6.2	6	9	(N/A)	0.1	0.0	8.99
Black locust	0.3	24	47.4	46	71	(N/A)	0.1	0.1	70.84
Red maple	0.0	0	0.7	1	1	(N/A)	0.1	0.0	1.03
Paper birch	0.1	7	13.7	13	21	(N/A)	0.1	0.0	20.64
Broadleaf Deciduous Large	0.0	0	0.5	0	1	(N/A)	0.1	0.0	0.66
Plum	0.0	0	0.6	1	1	(N/A)	0.1	0.0	0.87
Eastern hemlock	0.0	2	4.0	4	6	(N/A)	0.1	0.0	5.61
Broadleaf Deciduous Mediu	0.0	0	0.8	1	1	(N/A)	0.1	0.0	1.10
Ginkgo	0.2	18	32.0	31	49	(N/A)	0.1	0.1	49.28
Total	246.2	18,683	33,629.0	32,956	51,640	(N/A)	100.0	100.0	52.27

Table 2: Annual Stormwater Benefits

Table 3: Annual Air Quality Benefits

Britt

Annual Air Quality Benefits of Public Trees

4/10/2020

Species	Deposition (lb)				Total Depos. ($)	Avoided (lb)				Total Avoided ($)	BVOC Emissions (lb)	BVOC Emissions ($)	Total (lb)	Total ($)	Standard Error	% of Total Trees	Avg. $/tree
	O_3	NO_2	PM_{10}	SO_2		NO_2	PM_{10}	VOC	SO_2								
Green ash	120.3	19.2	56.6	5.4	638	376.3	54.8	52.3	357.6	2,345	0.0	0	1,042.5	2,983	(N/A)	26.0	11.61
Silver maple	190.6	32.3	92.0	8.5	1,023	301.5	44.1	42.1	289.1	1,886	-99.1	-372	901.1	2,537	(N/A)	17.7	14.50
Northern hackberry	27.2	4.7	14.2	1.2	149	101.3	14.7	14.0	95.1	628	0.0	0	272.3	777	(N/A)	8.5	9.26
Norway maple	37.7	6.5	18.5	1.7	203	96.5	14.0	13.3	90.6	599	-8.8	-33	269.9	769	(N/A)	8.2	9.49
Honeylocust	21.8	3.6	10.0	1.0	115	52.7	7.7	7.4	50.7	330	-16.5	-62	138.4	384	(N/A)	3.8	10.10
Apple	6.2	1.0	2.9	0.3	33	22.3	3.2	3.0	20.6	137	0.0	0	59.5	170	(N/A)	3.6	4.73
Sugar maple	3.0	0.5	1.7	0.1	17	16.2	2.4	2.3	15.5	101	-2.5	-9	39.2	109	(N/A)	3.4	3.20
Spruce	8.3	1.7	6.8	1.0	55	18.1	2.7	2.5	17.4	114	-36.4	-136	22.2	32	(N/A)	3.3	0.96
Northern red oak	3.4	0.6	1.7	0.2	19	10.3	1.5	1.4	9.7	64	-4.9	-19	23.9	64	(N/A)	3.2	2.00
Black walnut	9.8	1.6	4.6	0.4	52	30.7	4.5	4.3	29.0	191	0.0	0	85.0	243	(N/A)	2.0	12.16
Maple	2.3	0.4	1.2	0.1	13	10.6	1.5	1.5	10.0	66	-0.9	-3	26.8	75	(N/A)	2.0	3.77
Cottonwood	18.6	3.0	8.2	0.8	97	32.9	4.8	4.6	31.4	205	0.0	0	104.3	302	(N/A)	1.6	18.90
Northern catalpa	13.6	2.2	6.0	0.6	71	26.2	3.8	3.6	25.0	163	0.0	0	81.1	235	(N/A)	1.4	16.75
Littleleaf linden	3.6	0.6	1.8	0.2	19	11.1	1.6	1.5	10.4	69	-1.7	-7	28.9	81	(N/A)	1.4	5.81
Eastern red cedar	4.1	0.8	3.2	0.5	27	6.5	0.9	0.9	6.1	40	-10.8	-41	12.2	26	(N/A)	1.2	2.19
Kentucky coffeetree	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.4	3	0.0	0	0.9	3	(N/A)	1.2	0.21
Northern white cedar	2.4	0.5	2.0	0.3	16	4.3	0.6	0.6	4.1	27	-11.6	-43	3.4	0	(N/A)	0.8	-0.03
Swamp white oak	0.0	0.0	0.0	0.0	0	0.3	0.0	0.0	0.3	2	0.0	0	0.8	2	(N/A)	0.8	0.27
Broadleaf Deciduous Small	0.7	0.1	0.3	0.0	4	2.4	0.3	0.3	2.2	15	0.0	0	6.5	18	(N/A)	0.7	2.64
River birch	0.8	0.1	0.4	0.0	5	3.7	0.5	0.5	3.4	23	-0.2	-1	9.3	26	(N/A)	0.6	4.39
American sycamore	2.5	0.4	1.1	0.1	13	6.3	0.9	0.9	5.9	39	0.0	0	18.1	52	(N/A)	0.6	8.66
Mulberry	1.8	0.3	0.8	0.1	10	4.7	0.7	0.6	4.3	29	0.0	0	13.3	38	(N/A)	0.6	6.41
American basswood	2.3	0.4	1.1	0.1	13	7.3	1.1	1.0	6.9	45	-2.0	-7	18.3	51	(N/A)	0.6	8.42
Willow	0.5	0.1	0.3	0.0	3	3.3	0.5	0.5	3.1	20	-0.2	-1	8.1	23	(N/A)	0.5	4.58
Amur maple	1.6	0.3	0.7	0.1	8	4.2	0.6	0.6	3.9	26	0.0	0	11.9	34	(N/A)	0.5	6.83
Ohio buckeye	0.1	0.0	0.1	0.0	1	1.5	0.2	0.2	1.3	9	0.0	0	3.4	9	(N/A)	0.5	1.90
Eastern redbud	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.4	3	0.0	0	1.0	3	(N/A)	0.5	0.59
Bur oak	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.4	10	(N/A)	0.5	1.93
Boxelder	1.6	0.3	0.7	0.1	8	4.7	0.7	0.7	4.5	29	-0.6	-2	12.6	36	(N/A)	0.4	8.90
Elm	0.5	0.1	0.3	0.0	3	2.2	0.3	0.3	2.1	14	0.0	0	5.7	16	(N/A)	0.3	5.45
American elm	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.4	3	0.0	0	0.9	3	(N/A)	0.3	0.87
Black maple	0.7	0.1	0.4	0.0	4	2.9	0.4	0.4	2.8	18	-0.3	-1	7.5	21	(N/A)	0.3	7.05
Pear	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.0	7	0.0	0	2.7	8	(N/A)	0.3	2.55
Conifer Evergreen Large	0.1	0.0	0.1	0.0	0	0.4	0.1	0.1	0.4	2	-0.2	-1	0.8	2	(N/A)	0.2	1.02
Lilac	0.4	0.1	0.2	0.0	2	1.0	0.1	0.1	0.9	6	0.0	0	2.9	8	(N/A)	0.2	4.23
Cherry plum	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.1	0	(N/A)	0.2	0.11
Oak	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1	(N/A)	0.2	0.48
White ash	0.9	0.2	0.4	0.0	5	2.4	0.4	0.3	2.3	15	0.0	0	7.0	20	(N/A)	0.2	10.05
Blue spruce	0.6	0.1	0.5	0.1	4	1.1	0.2	0.2	1.0	7	-1.4	-5	2.4	6	(N/A)	0.2	2.85
Eastern white pine	0.2	0.0	0.1	0.0	1	0.6	0.1	0.1	0.6	4	-0.5	-2	1.2	3	(N/A)	0.1	2.82
Birch	0.0	0.0	0.0	0.0	0	0.2	0.0	0.0	0.2	1	0.0	0	0.4	1	(N/A)	0.1	1.21
Black locust	0.9	0.1	0.4	0.0	5	1.6	0.2	0.2	1.5	10	-0.2	-1	4.7	14	(N/A)	0.1	13.58
Red maple	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0	(N/A)	0.1	0.13
Paper birch	0.0	0.0	0.0	0.0	0	0.5	0.1	0.1	0.4	3	0.0	0	1.1	3	(N/A)	0.1	2.99
Broadleaf Deciduous Large	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0	(N/A)	0.1	0.08
Plum	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0	(N/A)	0.1	0.11
Eastern hemlock	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	-0.1	0	0.2	1	(N/A)	0.1	0.56
Broadleaf Deciduous Medium	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0	(N/A)	0.1	0.14
Ginkgo	0.5	0.1	0.3	0.0	3	1.1	0.2	0.2	1.1	7	-0.2	-1	3.3	9	(N/A)	0.1	9.29
Citywide total	490.4	82.0	240.1	23.1	2,642	1,173.9	171.0	163.0	1,115.1	7,315	-199.2	-747	3,259.6	9,210	(N/A)	100.0	9.32

Table 4: Annual Carbon Stored

Britt

Stored CO2 Benefits of Public Trees

4/10/2020

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	3,952,211	29,642	(N/A)	26.0	32.5	115.34
Silver maple	4,590,978	34,432	(N/A)	17.7	37.7	196.76
Northern hackberry	402,047	3,015	(N/A)	8.5	3.3	35.90
Norway maple	620,620	4,655	(N/A)	8.2	5.1	57.46
Honeylocust	277,587	2,082	(N/A)	3.8	2.3	54.79
Apple	97,571	732	(N/A)	3.6	0.8	20.33
Sugar maple	85,436	641	(N/A)	3.4	0.7	18.85
Spruce	89,756	673	(N/A)	3.3	0.7	20.40
Northern red oak	73,075	548	(N/A)	3.2	0.6	17.13
Black walnut	318,845	2,391	(N/A)	2.0	2.6	119.57
Maple	28,889	217	(N/A)	2.0	0.2	10.83
Cottonwood	638,415	4,788	(N/A)	1.6	5.2	299.26
Northern catalpa	467,567	3,507	(N/A)	1.4	3.8	250.48
Littleleaf linden	76,570	574	(N/A)	1.4	0.6	41.02
Eastern red cedar	13,225	99	(N/A)	1.2	0.1	8.27
Kentucky coffeetree	493	4	(N/A)	1.2	0.0	0.31
Northern white cedar	29,418	221	(N/A)	0.8	0.2	27.58
Swamp white oak	336	3	(N/A)	0.8	0.0	0.32
Broadleaf Deciduous	10,907	82	(N/A)	0.7	0.1	11.69
River birch	14,006	105	(N/A)	0.6	0.1	17.51
American sycamore	82,380	618	(N/A)	0.6	0.7	102.97
Mulberry	28,787	216	(N/A)	0.6	0.2	35.98
American basswood	90,228	677	(N/A)	0.6	0.7	112.78
Willow	9,466	71	(N/A)	0.5	0.1	14.20
Amur maple	24,173	181	(N/A)	0.5	0.2	36.26
Ohio buckeye	2,655	20	(N/A)	0.5	0.0	3.98
Eastern redbud	963	7	(N/A)	0.5	0.0	1.44
Bur oak	8,506	64	(N/A)	0.5	0.1	12.76
Boxelder	52,977	397	(N/A)	0.4	0.4	99.33
Elm	16,993	127	(N/A)	0.3	0.1	42.48
American elm	935	7	(N/A)	0.3	0.0	2.34
Black maple	8,349	63	(N/A)	0.3	0.1	20.87
Pear	2,724	20	(N/A)	0.3	0.0	6.81
Conifer Evergreen La	295	2	(N/A)	0.2	0.0	1.11
Lilac	6,756	51	(N/A)	0.2	0.1	25.34
Cherry plum	28	0	(N/A)	0.2	0.0	0.10
Oak	198	1	(N/A)	0.2	0.0	0.74
White ash	16,807	126	(N/A)	0.2	0.1	63.03
Blue spruce	5,178	39	(N/A)	0.2	0.0	19.42
Eastern white pine	1,170	9	(N/A)	0.1	0.0	8.78
Birch	218	2	(N/A)	0.1	0.0	1.64
Black locust	14,280	107	(N/A)	0.1	0.1	107.10
Red maple	17	0	(N/A)	0.1	0.0	0.13
Paper birch	1,035	8	(N/A)	0.1	0.0	7.76
Broadleaf Deciduous	12	0	(N/A)	0.1	0.0	0.09
Plum	14	0	(N/A)	0.1	0.0	0.10
Eastern hemlock	38	0	(N/A)	0.1	0.0	0.29
Broadleaf Deciduous	17	0	(N/A)	0.1	0.0	0.13
Ginkgo	7,800	59	(N/A)	0.1	0.1	58.50
Citywide total	12,170,950	91,282	(N/A)	100.0	100.0	92.39

Table 5: Annual Carbon Sequestered

Britt

Annual CO Benefits of Public Trees

4/10/2020

Species	Sequestered (lb)	Sequestered ($)	Decomposition Release (lb)	Maintenance Release (lb)	Total Released ($)	Avoided (lb)	Avoided ($)	Net Total (lb)	Total Standard ($) Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	183,291	1,375	-18,971	-827	-148	132,330	992	295,824	2,219 (N/A)	26.0	29.4	8.63
Silver maple	305,167	2,289	-22,037	-751	-171	107,238	804	389,618	2,922 (N/A)	17.7	38.7	16.70
Northern hackberry	24,691	185	-1,932	-195	-16	35,150	264	57,714	433 (N/A)	8.5	5.7	5.15
Norway maple	26,087	196	-2,979	-209	-24	33,499	251	56,398	423 (N/A)	8.2	5.6	5.22
Honeylocust	24,179	181	-1,333	-88	-11	18,772	141	41,530	311 (N/A)	3.8	4.1	8.20
Apple	5,828	44	-468	-64	-4	7,618	57	12,915	97 (N/A)	3.6	1.3	2.69
Sugar maple	6,418	48	-420	-39	-3	5,735	43	11,694	88 (N/A)	3.4	1.2	2.58
Spruce	4,008	30	-431	-71	-4	6,452	48	9,958	75 (N/A)	3.3	1.0	2.26
Northern red oak	2,679	20	-351	-29	-3	3,601	27	5,899	44 (N/A)	3.2	0.6	1.38
Black walnut	15,795	118	-1,530	-68	-12	10,745	81	24,941	187 (N/A)	2.0	2.5	9.35
Maple	3,035	23	-139	-22	-1	3,707	28	6,581	49 (N/A)	2.0	0.7	2.47
Cottonwood	12,176	91	-3,064	-80	-24	11,617	87	20,649	155 (N/A)	1.6	2.1	9.68
Northern catalpa	9,740	73	-2,244	-62	-17	9,255	69	16,688	125 (N/A)	1.4	1.7	8.94
Littleleaf linden	6,402	48	-369	-28	-3	3,844	29	9,849	74 (N/A)	1.4	1.0	5.28
Eastern red cedar	43	0	-63	-23	-1	2,242	17	2,198	16 (N/A)	1.2	0.2	1.37
Kentucky coffeetree	174	1	-3	-3	0	141	1	310	2 (N/A)	1.2	0.0	0.19
Northern white cedar	434	3	-141	-20	-1	1,532	11	1,806	14 (N/A)	0.8	0.2	1.69
Swamp white oak	134	1	-3	-2	0	115	1	244	2 (N/A)	0.8	0.0	0.23
Broadleaf Deciduous Smal	924	7	-52	-7	0	821	6	1,686	13 (N/A)	0.7	0.2	1.81
River birch	1,405	11	-68	-8	-1	1,258	9	2,587	19 (N/A)	0.6	0.3	3.23
American sycamore	3,086	23	-395	-15	-3	2,193	16	4,868	37 (N/A)	0.6	0.5	6.08
Mulberry	706	5	-138	-16	-1	1,587	12	2,140	16 (N/A)	0.6	0.2	2.67
American basswood	5,007	38	-433	-17	-3	2,565	19	7,121	53 (N/A)	0.6	0.7	8.90
Willow	1,225	9	-45	-6	0	1,149	9	2,322	17 (N/A)	0.5	0.2	3.48
Amur maple	860	6	-116	-13	-1	1,437	11	2,168	16 (N/A)	0.5	0.2	3.25
Ohio buckeye	645	5	-14	-4	0	488	4	1,115	8 (N/A)	0.5	0.1	1.67
Eastern redbud	149	1	-5	-2	0	147	1	288	2 (N/A)	0.5	0.0	0.43
Bur oak	670	5	-41	-4	0	459	3	1,085	8 (N/A)	0.5	0.1	1.63
Boxelder	3,881	29	-254	-13	-2	1,655	12	5,269	40 (N/A)	0.4	0.5	9.88
Elm	1,140	9	-82	-5	-1	760	6	1,813	14 (N/A)	0.3	0.2	4.53
American elm	126	1	-5	-2	0	141	1	260	2 (N/A)	0.3	0.0	0.65
Black maple	1,132	8	-40	-5	0	1,047	8	2,134	16 (N/A)	0.3	0.2	5.33
Pear	342	3	-13	-4	0	372	3	697	5 (N/A)	0.3	0.1	1.74
Conifer Evergreen Large	71	1	-1	-2	0	132	1	200	1 (N/A)	0.2	0.0	0.75
Lilac	487	4	-32	-3	0	340	3	792	6 (N/A)	0.2	0.1	2.97
Cherry plum	17	0	0	0	0	11	0	28	0 (N/A)	0.2	0.0	0.10
Oak	77	1	-1	-1	0	53	0	128	1 (N/A)	0.2	0.0	0.48
White ash	1,497	11	-81	-5	-1	860	6	2,272	17 (N/A)	0.2	0.2	8.52
Blue spruce	227	2	-25	-5	0	386	3	584	4 (N/A)	0.2	0.1	2.19
Eastern white pine	116	1	-6	-2	0	216	2	324	2 (N/A)	0.1	0.0	2.43
Birch	96	1	-2	-1	0	65	0	158	1 (N/A)	0.1	0.0	1.18
Black locust	370	3	-69	-4	-1	539	4	837	6 (N/A)	0.1	0.1	6.27
Red maple	3	0	0	0	0	7	0	9	0 (N/A)	0.1	0.0	0.07
Paper birch	209	2	-5	-1	0	159	1	361	3 (N/A)	0.1	0.0	2.71
Broadleaf Deciduous Large	3	0	0	0	0	4	0	7	0 (N/A)	0.1	0.0	0.05
Plum	9	0	0	0	0	6	0	14	0 (N/A)	0.1	0.0	0.10
Eastern hemlock	18	0	0	-1	0	38	0	55	0 (N/A)	0.1	0.0	0.41
Broadleaf Deciduous Medi	5	0	0	0	0	7	0	12	0 (N/A)	0.1	0.0	0.09
Ginkgo	319	2	-37	-4	0	396	3	674	5 (N/A)	0.1	0.1	5.06
Citywide total	655,101	4,913	-58,440	-2,730	-459	412,893	3,097	1,006,824	7,551 (N/A)	100.0	100.0	7.64

Table 6: Annual Social and Aesthetic Benefits

Britt

Annual Aesthetic/Other Benefits of Public Trees

4/10/2020

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	14,646	(N/A)	26.0	25.7	56.99
Silver maple	22,155	(N/A)	17.7	38.9	126.60
Northern hackberry	3,586	(N/A)	8.5	6.3	42.69
Norway maple	2,495	(N/A)	8.2	4.4	30.80
Honeylocust	5,523	(N/A)	3.8	9.7	145.34
Apple	337	(N/A)	3.6	0.6	9.36
Sugar maple	727	(N/A)	3.4	1.3	21.39
Spruce	868	(N/A)	3.3	1.5	26.31
Northern red oak	255	(N/A)	3.2	0.4	7.96
Black walnut	1,230	(N/A)	2.0	2.2	61.48
Maple	504	(N/A)	2.0	0.9	25.22
Cottonwood	803	(N/A)	1.6	1.4	50.21
Northern catalpa	687	(N/A)	1.4	1.2	49.04
Littleleaf linden	683	(N/A)	1.4	1.2	48.82
Eastern red cedar	14	(N/A)	1.2	0.0	1.14
Kentucky coffeetree	82	(N/A)	1.2	0.1	6.84
Northern white cedar	121	(N/A)	0.8	0.2	15.14
Swamp white oak	32	(N/A)	0.8	0.1	4.00
Broadleaf Deciduous Small	53	(N/A)	0.7	0.1	7.55
River birch	150	(N/A)	0.6	0.3	25.05
American sycamore	249	(N/A)	0.6	0.4	41.43
Mulberry	42	(N/A)	0.6	0.1	6.94
American basswood	347	(N/A)	0.6	0.6	57.76
Willow	133	(N/A)	0.5	0.2	26.70
Amur maple	51	(N/A)	0.5	0.1	10.14
Ohio buckeye	81	(N/A)	0.5	0.1	16.19
Eastern redbud	7	(N/A)	0.5	0.0	1.31
Bur oak	79	(N/A)	0.5	0.1	15.75
Boxelder	247	(N/A)	0.4	0.4	61.80
Elm	109	(N/A)	0.3	0.2	36.29
American elm	24	(N/A)	0.3	0.0	7.91
Black maple	162	(N/A)	0.3	0.3	53.87
Pear	19	(N/A)	0.3	0.0	6.40
Conifer Evergreen Large	22	(N/A)	0.2	0.0	11.13
Lilac	29	(N/A)	0.2	0.1	14.42
Cherry plum	0	(N/A)	0.2	0.0	0.03
Oak	20	(N/A)	0.2	0.0	10.00
White ash	160	(N/A)	0.2	0.3	79.89
Blue spruce	34	(N/A)	0.2	0.1	16.95
Eastern white pine	32	(N/A)	0.1	0.1	32.32
Birch	13	(N/A)	0.1	0.0	12.89
Black locust	31	(N/A)	0.1	0.1	31.46
Red maple	0	(N/A)	0.1	0.0	0.04
Paper birch	29	(N/A)	0.1	0.1	28.56
Broadleaf Deciduous Large	5	(N/A)	0.1	0.0	5.26
Plum	0	(N/A)	0.1	0.0	0.03
Eastern hemlock	7	(N/A)	0.1	0.0	6.83
Broadleaf Deciduous Medium	3	(N/A)	0.1	0.0	2.74
Ginkgo	23	(N/A)	0.1	0.0	22.94
Citywide total	56,908	(N/A)	100.0	100.0	57.60

Table 7: Summary of Benefits in Dollars

Britt

Total Annual Benefits of Public Trees by Species ($)

4/10/2020

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Green ash	16,530	2,219	2,983	24,796	14,646	61,175	(N/A)	29.7
Silver maple	13,116	2,922	2,537	27,524	22,155	68,254	(N/A)	33.1
Northern hackberry	4,517	433	777	5,037	3,586	14,351	(N/A)	7.0
Norway maple	4,302	423	769	4,996	2,495	12,985	(N/A)	6.3
Honeylocust	2,283	311	384	3,078	5,523	11,579	(N/A)	5.6
Apple	1,022	97	170	541	337	2,168	(N/A)	1.1
Sugar maple	713	88	109	747	727	2,384	(N/A)	1.2
Spruce	787	75	32	1,945	868	3,707	(N/A)	1.8
Northern red oak	457	44	64	484	255	1,305	(N/A)	0.6
Black walnut	1,361	187	243	2,077	1,230	5,098	(N/A)	2.5
Maple	472	49	75	376	504	1,478	(N/A)	0.7
Cottonwood	1,437	155	302	2,813	803	5,510	(N/A)	2.7
Northern catalpa	1,137	125	235	2,129	687	4,312	(N/A)	2.1
Littleleaf linden	492	74	81	592	683	1,922	(N/A)	0.9
Eastern red cedar	295	16	26	532	14	883	(N/A)	0.4
Kentucky coffeetree	18	2	3	14	82	119	(N/A)	0.1
Northern white cedar	191	14	0	554	121	879	(N/A)	0.4
Swamp white oak	17	2	2	7	32	59	(N/A)	0.0
Broadleaf Deciduous Sn	110	13	18	60	53	254	(N/A)	0.1
River birch	164	19	26	142	150	502	(N/A)	0.2
American sycamore	276	37	52	478	249	1,091	(N/A)	0.5
Mulberry	221	16	38	142	42	459	(N/A)	0.2
American basswood	317	53	51	445	347	1,212	(N/A)	0.6
Willow	144	17	23	108	133	426	(N/A)	0.2
Amur maple	195	16	34	121	51	417	(N/A)	0.2
Ohio buckeye	68	8	9	41	81	208	(N/A)	0.1
Eastern redbud	22	2	3	8	7	41	(N/A)	0.0
Bur oak	60	8	10	72	79	229	(N/A)	0.1
Boxelder	211	40	36	314	247	847	(N/A)	0.4
Elm	97	14	16	128	109	364	(N/A)	0.2
American elm	18	2	3	12	24	58	(N/A)	0.0
Black maple	122	16	21	104	162	425	(N/A)	0.2
Pear	55	5	8	22	19	108	(N/A)	0.1
Conifer Evergreen Large	19	1	2	22	22	67	(N/A)	0.0
Lilac	47	6	8	32	29	122	(N/A)	0.1
Cherry plum	2	0	0	0	0	3	(N/A)	0.0
Oak	6	1	1	5	20	34	(N/A)	0.0
White ash	105	17	20	160	160	463	(N/A)	0.2
Blue spruce	50	4	6	100	34	194	(N/A)	0.1
Eastern white pine	24	2	3	42	32	103	(N/A)	0.1
Birch	9	1	1	4	13	29	(N/A)	0.0
Black locust	71	6	14	102	31	224	(N/A)	0.1
Red maple	1	0	0	0	0	2	(N/A)	0.0
Paper birch	21	3	3	16	29	71	(N/A)	0.0
Broadleaf Deciduous La	1	0	0	0	5	7	(N/A)	0.0
Plum	1	0	0	0	0	1	(N/A)	0.0
Eastern hemlock	6	0	1	6	7	19	(N/A)	0.0
Broadleaf Deciduous M	1	0	0	0	3	4	(N/A)	0.0
Ginkgo	49	5	9	50	23	137	(N/A)	0.1
Citywide Total	51,640	7,551	9,210	80,979	56,908	206,287	(N/A)	100.0

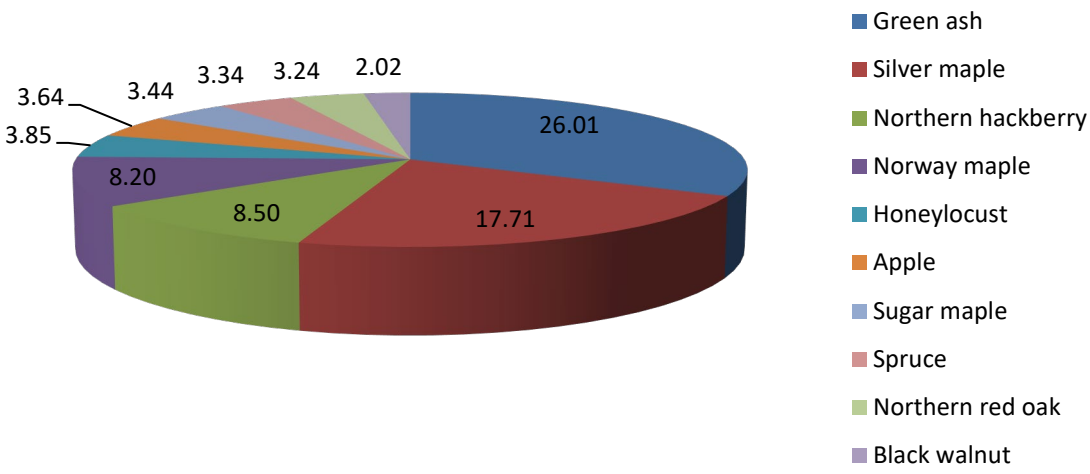

Figure 1: Species Distribution

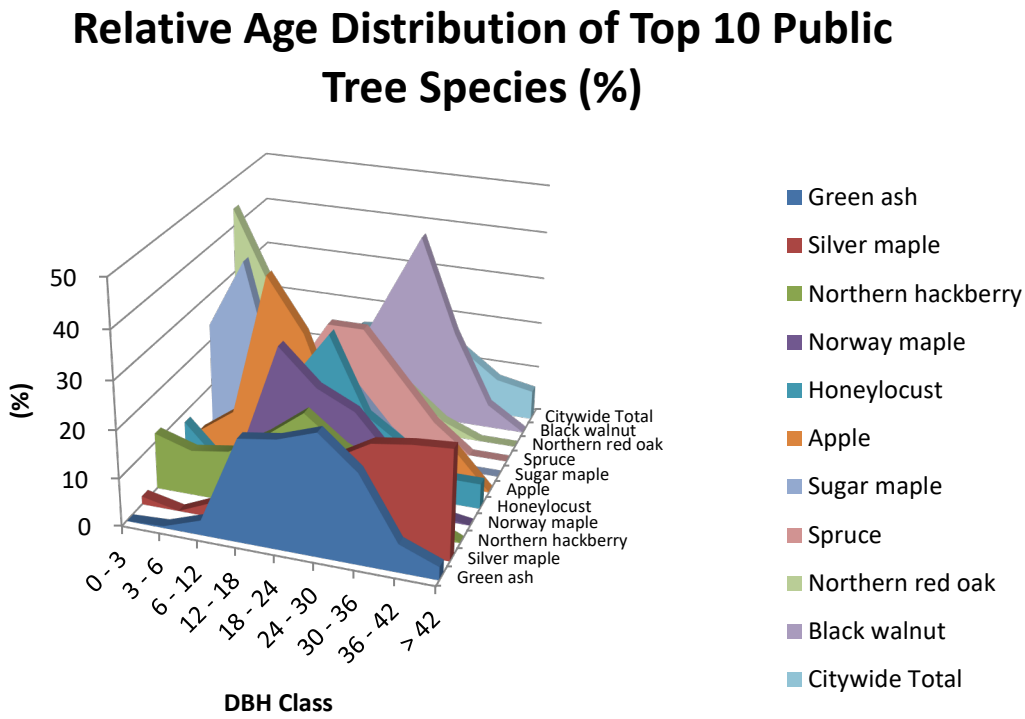

Figure 2: Relative Age Class

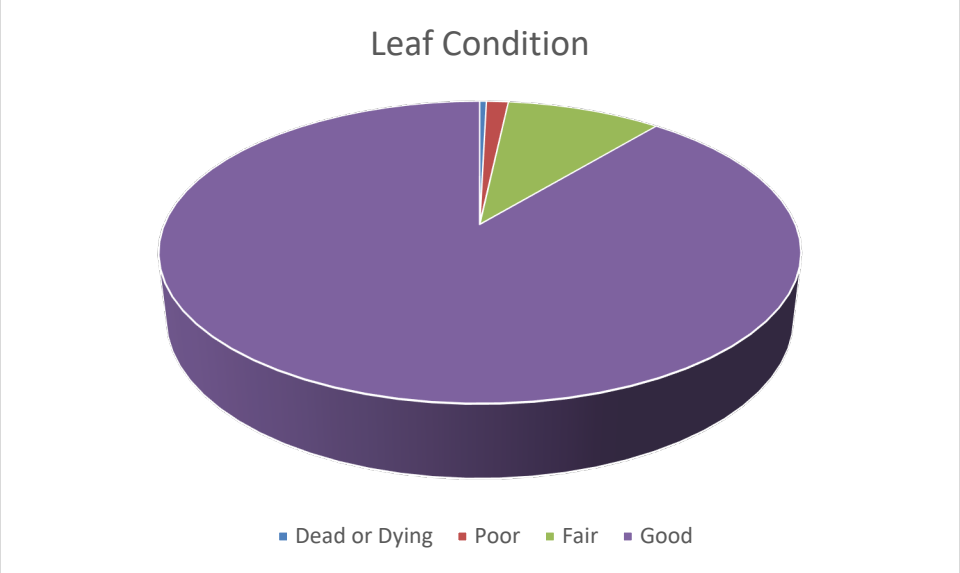

Figure 3: Foliage Condition

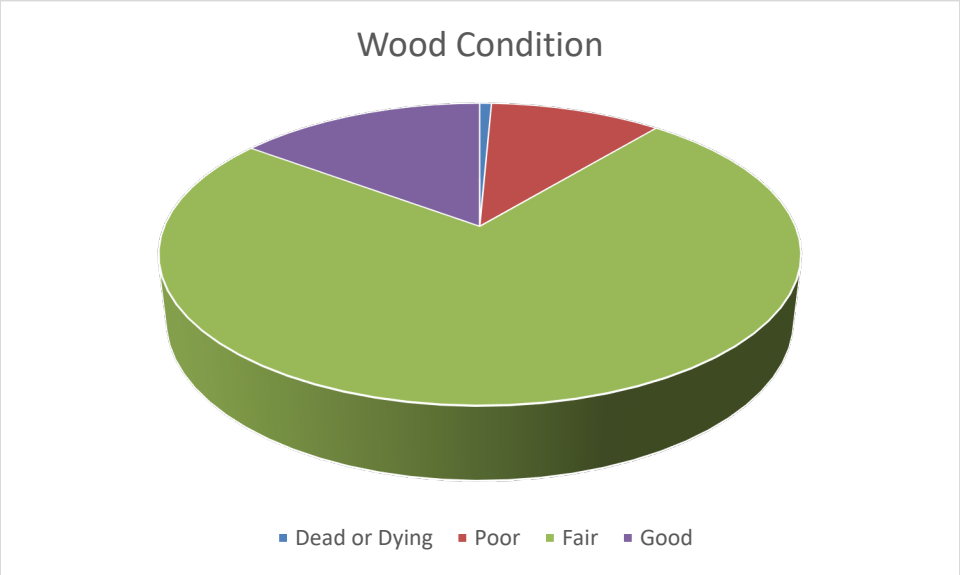

Figure 4: Wood Condition

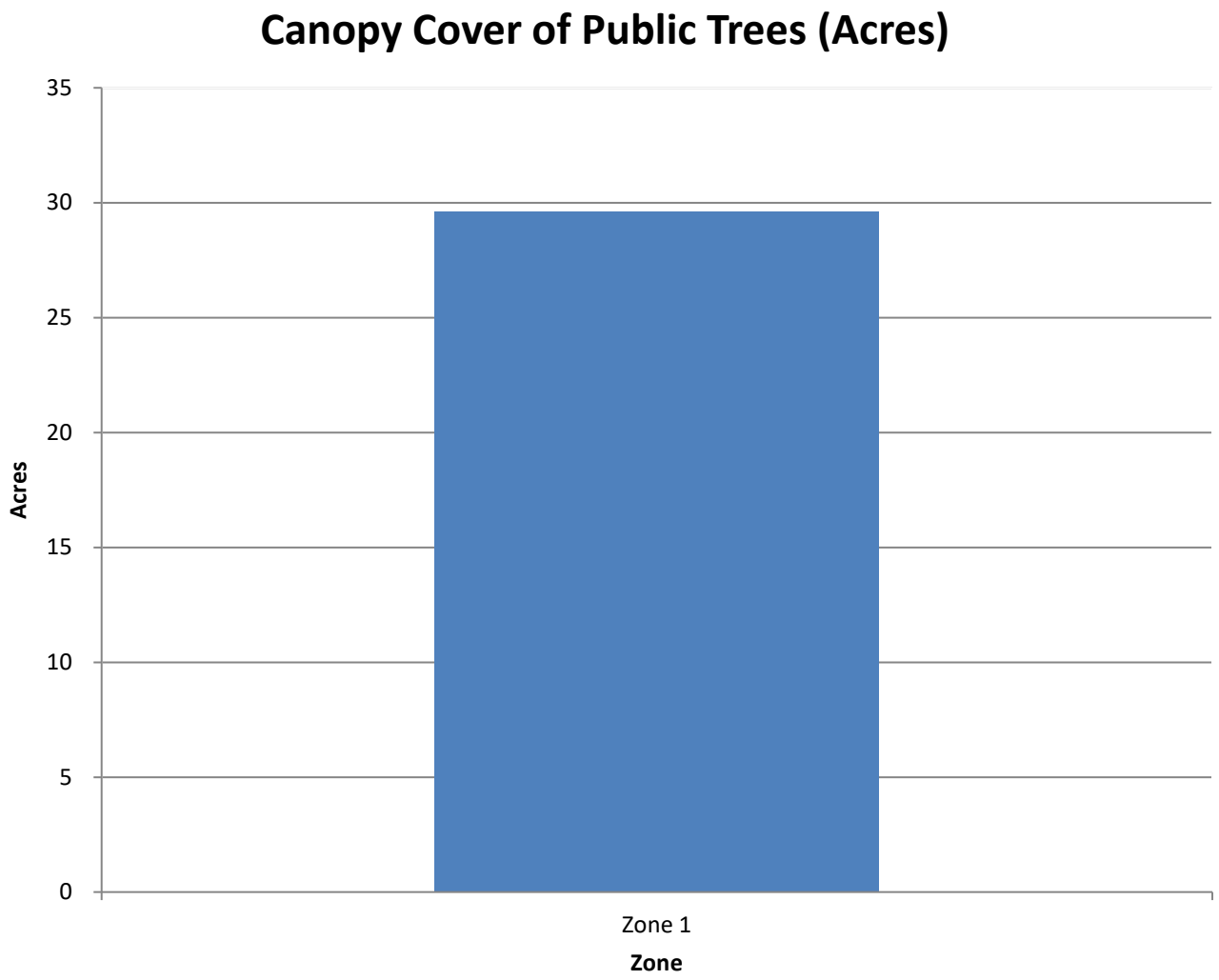

Figure 5: Canopy Cover in Acres

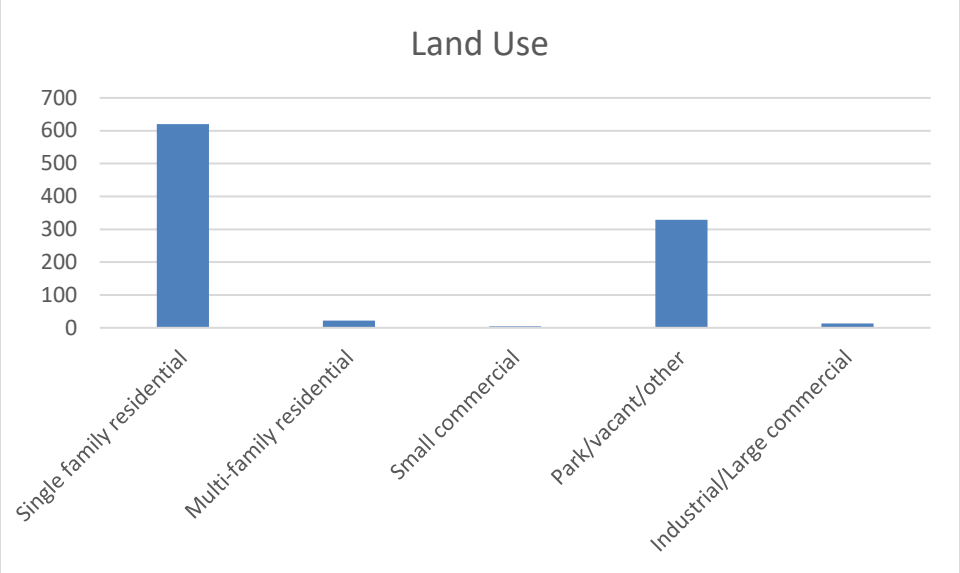

Figure 6: Land Use of city/park trees

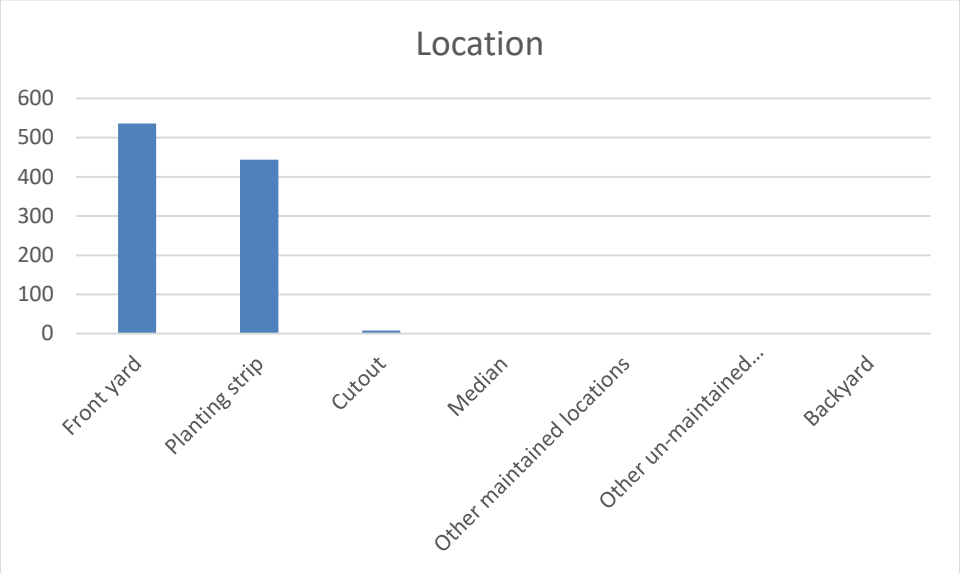

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

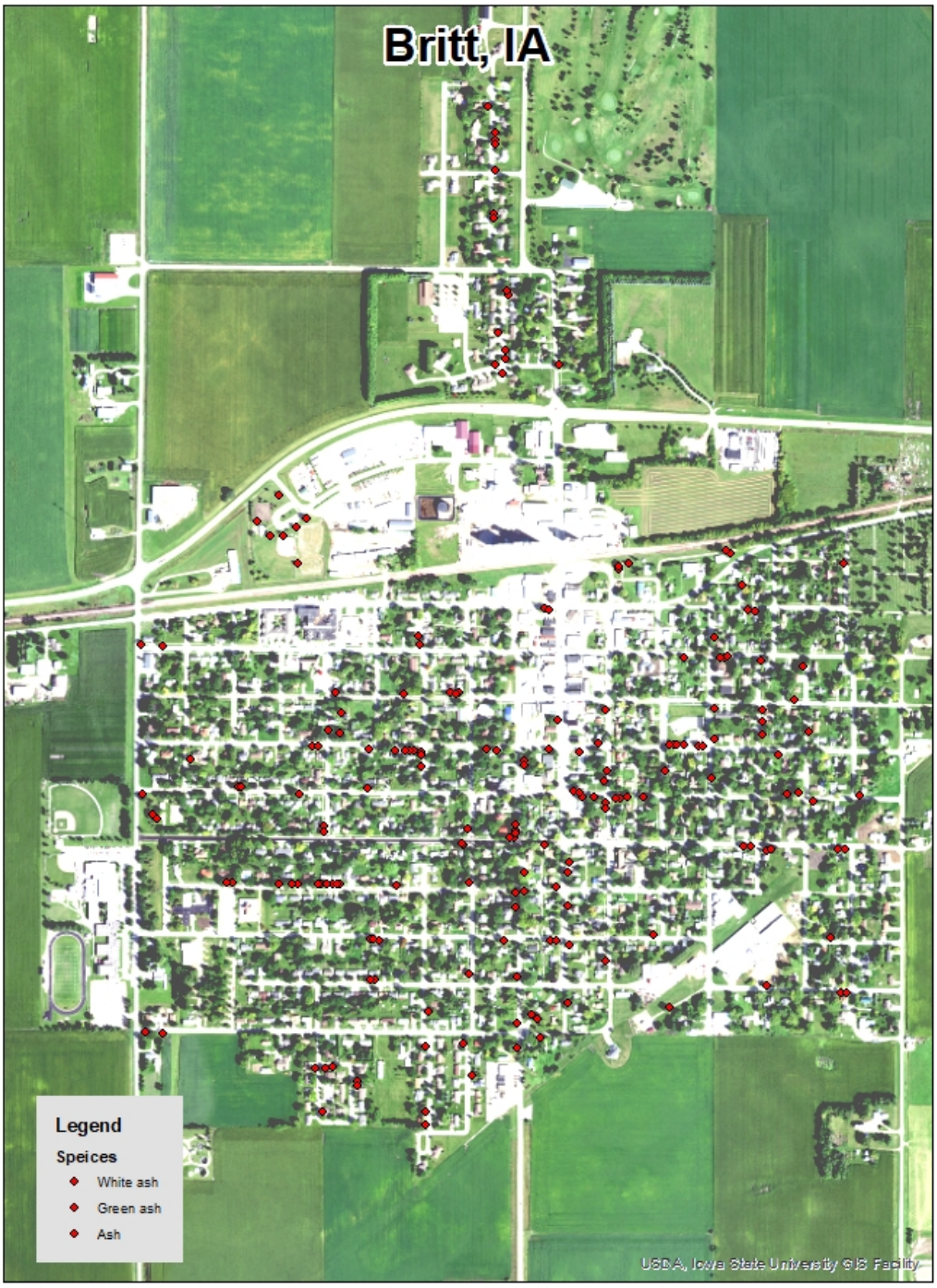

Figure 1: Location of Ash Trees

Figure 2: Location of EAB symptoms

Figure 3: Location of Poor Condition Trees

Figure 4: Location of Trees with Recommended Maintenance

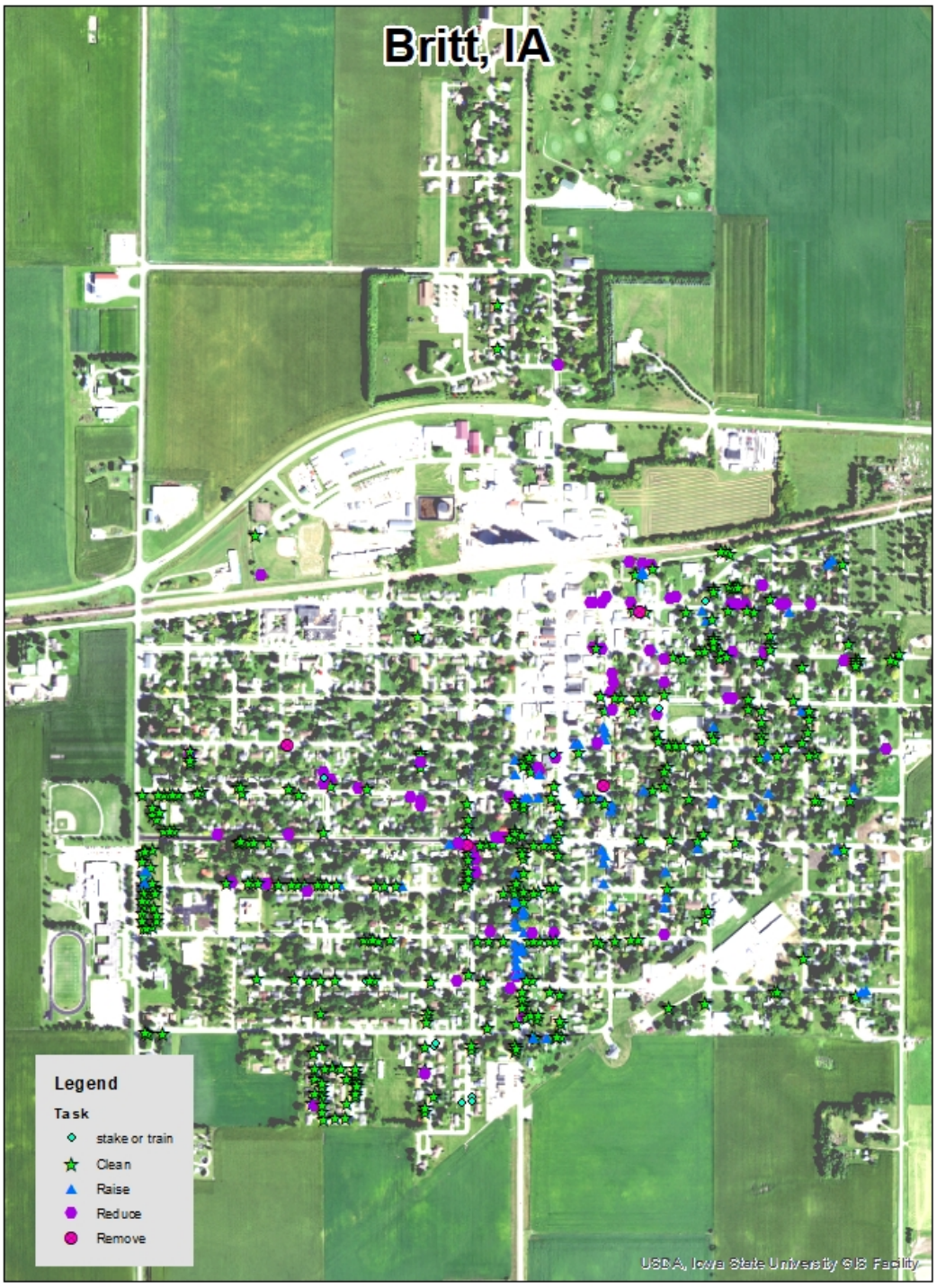

Figure 5: Maintenance Tasks ***City ownership of the trees recommended for removal should be verified prior to any removal***

Appendix C: Britt Tree Ordinances

TITLE VI PHYSICAL ENVIRONMENT
CHAPTER 8 TREES

6-8-1 PURPOSE. The purpose of this chapter is to beautify and preserve the appearance of the City by regulating and providing for the planting, care and removal of trees.

6-8-2 DEFINITIONS. For use in this chapter, the following terms are defined:

1. "Parking" means that part of the street, avenue or highway in the City not covered by sidewalk and lying between the lot line and the curb line; or, on unpaved streets, that part of the street, avenue or highway lying between the lot line and that portion of the street usually traveled by vehicular traffic.
2. "Superintendent" means superintendent of streets or such other person as may be designated by the Council.

6-8-3 PLANTING RESTRICTIONS. No tree shall be planted in any street or parking except in accordance with the following:

1. Alignment. All trees hereafter planted in any street shall be planted in the parking midway between the outer line of the sidewalk and the curb. In the event a curb line is not established, trees shall be planted on a line ten (10) feet from the property line.
2. Spacing. Trees shall not be planted on the parking if it is less than nine (9) feet in width, or contains less than eighty-one (81) square feet of exposed soil surface per tree. Trees shall not be planted closer than twenty (20) feet to street intersections (property lines extended) and ten (10) feet to the driveways. If it is at all possible trees should be planted inside the property lines and not between the sidewalk and the curb.
3. Prohibited Trees. No person shall hereinafter plant in any street, any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, box elder, Chinese elm, or evergreens.

6-8-4 DUTY TO TRIM TREES. The owner or agent of the abutting property shall keep the trees on, or overhanging the street trimmed so that all branches will be at least fifteen (15) feet above the surface of the street and eight (8) feet above the sidewalks.

6-8-5 ASSESSMENT. If the abutting property owner fails to trim the trees as required in this chapter, the City may serve notice on the abutting property owner requiring him to do so within five (5) days. If he fails to trim the trees within that time, the City may perform the required action and assess the costs against the abutting property for collection in the same manner as a property tax.

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6-8-6 TRIMMING TREES TO BE SUPERVISED. It shall be unlawful for any person to trim or cut any tree in a street or public place unless the work is done under the supervision of the City.

6-8-7 REMOVAL OF TREES. The superintendent shall remove, on the order of the Council, any tree on the streets of the City which interferes with the making of improvements or with travel thereon. He shall additionally remove any trees on the street, not on private property, which have become diseased, or which constitute a danger to the public, or which may otherwise be declared a nuisance.

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Federal law prohibits employment discrimination on the basis of race, color, age, religion, national origin, sex or disability. State law prohibits employment discrimination on the basis of race, color, creed, age, sex, sexual orientation, gender identity, national origin, religion, pregnancy, or disability. State law also prohibits public accommodation (such as access to services or physical facilities) discrimination on the basis of race, color, creed, religion, sex, sexual orientation, gender identity, religion, national origin, or disability. If you believe you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please contact the Iowa Civil Rights Commission, 1-800-457-4416, or write to the Iowa Department of Natural Resources, Wallace State Office Bldg., 502 E 9th St, Des Moines IA 50319.

If you need accommodations because of disability to access the services of this Agency, please contact the Director at 515-725-8200.